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POWDER RIVER

TRACT PROFILE
LITTLE RAWHIDE CREEK TRACT, WYOMING

REVISED

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

COAL
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TN
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no. 452

TRACT PROFILE INTRODUCTION

Background

In June 1980, the BLM, Casper District Office completed the Gillette Review Area Amendment to the Eastern Powder River Basin Management Framework Plan (BLM, 1979). The land use planning process included applying unsuitability criteria, multiple-use conflict evaluation, and surface owner consultations. As a result of that work, areas were identified that could be further considered for coal development. The areas are available for consideration for new competitive leasing, leasing by exchanging and modifying existing leases, and for preference right leasing.

Following land-use planning the BLM requested expression of interest which, along with other information, guided the GS in delineating this tract. Results of that work are summarized in this profile.

Personnel from BLM, Casper District inventoried the tract to determine the site specific resource values and then analyzed potential environmental effects of coal development on this individual tract. Among other items, the unsuitability criteria (43 CFR 3461) were reconsidered on this site-specific basis. Any new findings of unsuitability are reflected in the delineation and development proposal of the tract described in this profile.

To be further considered for new competitive leasing, the tract will be presented to the Regional Coal Team who guides and reviews tract ranking and selection and sale scheduling procedures that develop alternatives which would be analyzed in a regional environmental impact statement (EIS). The EIS would analyze the site-specific and regional cumulative effects of coal leasing and development. Alternatives addressed in the EIS would include different combinations of tracts that meet a regional coal leasing target. The analysis of those groups of tracts would result in different impacts than the assessment made in this document for this specific tract. During the process this preliminary tract could be modified. Ultimately, the Secretary will select specific tracts for lease sale. If the tract is leased, the lessee would be required to submit a plan for mining and reclamation (M&R) to the Secretary of Interior, Office of Surface Mining (OSM) for review and approval within 3 years after leasing. Once a mining plan has been submitted, OSM would review the proposed developments of the mining plan. OSM would prepare a site-specific environmental assessment or EIS prior to approval of the mine plan.

Development of the tract is in accordance with the federal coal management program adopted by the Secretary, Department of the Interior, in June 1979. Basis of the program was, in part, the Final Environmental Statement for the Federal Coal Management Program. Implementation procedures are contained in Title 43 - Code of Federal Regulations - Part 3400 (43 CFR 3400). Authorizing actions are The Mineral Leasing Act of 1920, as amended; The Mineral Leasing Act for Acquired Lands of 1947, as amended; the Federal Land Policy and Management Act of 1976; the Surface Mining Control and Reclamation Act of 1977; the Multiple Mineral Development Act of 1954; the Department of Energy Organization Act of 1977; the National Environmental Policy Act of 1969; the Federal Coal Leasing Amendments Act of 1976, as amended; the Act of October 30, 1978, and Federal Regulations concerning federal coal leasing and development including 43 CFR 3400; 30 CFR 211; and 30 CFR 700-899.

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In adopting the coal program, the Secretary established a tentative competitive coal leasing target of 776 million tons for 1982 in the Powder River Region of Wyoming and Montana. Subsequent sales would then follow on a 2 to 4 year cycle.

Purpose and Need for Action

Purpose of the action is to offer strippable federal coal reserves that can be further considered for coal leasing and development to help meet the energy needs of the nation.

This tract profile contains a summary of the tract delineation report and a site-specific analysis (SSA). The United States Department of the Interior, Geological Survey (GS) delineated the tract while the Bureau of Land Management (BLM) completed the site-specific environmental inventory and preliminary analysis.

Tract Delineation Report Summary

Tract Name: Little Rawhide Creek State: Wyoming

The Little Rawhide Creek tract is located on the eastern flank of the Powder River Basin, Campbell County, Wyoming. The tract contains one recoverable coal bed, the Wyodak, which is present in two seams.

The coal deposit occurs at the top of the Fort Union Formation (Paleocene), which comprises approximately 3,000 feet of sandstones, shales, siltstones, and coal seams. The formation dips gently westward toward the basin center. The coal is subbituminous in rank and weighs 1,770 tons per acre-foot. There are no known geologic hazards to surface mining in the Little Rawhide Creek tract. See the tract profile summary for the salient geologic data for the tract.

The generic mining plan calls for a surface mine using electric shovels, dump trucks, loaders, scrapers, and other support equipment. The coal would thus be mined to a depth of 250 feet or until the limiting stripping ratio (5:1) is reached. The plan indicates that the coal would be shipped by railroad to an electrical utility out of the Powder River Region.

There have been no expressions of interest in a small-business set-aside for the Little Rawhide Creek tract.

TRACT PROFILE SUMMARY

LITTLE RAWHIDE CREEK

COAL DATA

	Proposed Action
Total Strippable Reserves (m. tons)	100
Recoverable Reserves (m. tons)	90
Average coal thickness (ft.)	120
Average overburden (ft.)	200
Coal Rank	Subbituminous
Percent Recovery	90
Proximate Coal Analysis	
Percent moisture	30.5
Percent Ash	6.0
Percent Sulfur	0.4
BTU's per pound	8070
Mine life (years)	5
Annual Production Rate (m. tons)	20
Tract Area (acres)	491
Surface Mine/Truck and Shovel Operation	

EMPLOYMENT

Construction	None
Mine Operation	None

ENVIRONMENTAL DATA

AVFs	Possible AVF
Water Requirement (Ac/ft)	416
Reclamation Potential	Good (8 of 10)
Eagle Butte Mine Extension	

1. ALTERNATIVES INCLUDING PROPOSED ACTION

1.1 No Action Alternative

Under the no action alternative, the tract would not be leased and coal development would not occur. Approximately 90 million tons of coal would not be extracted or used.

1.2 Proposed Action

The proposed action is to consider for lease approximately 491 acres containing about 90 million tons of recoverable federal coal reserves within the Little Rawhide Creek tract for development as a mine extension for Eagle Butte Mine. See Figure 1.2-1 for general location and Map 1.2-1 for specific location and legal description of the tract. Development of the coal would be controlled by federal laws, regulations, and policies.

PROPOSED DEVELOPMENT PLAN

Mine and Reclamation Plan (M&R) Development and Approval

AMAX Coal Company would have to modify their mine plan for the Eagle Butte Mine, coal lease W-0313733.

During land use planning areas of land have been identified as possible alluvial valley floors (AVFs) as shown on Map 1.2-2. Although areas identified as possible AVFs are not excluded from consideration for leasing the Office of Surface Mining (OSM) and Wyoming Department of Environmental Quality (DEQ) would make a final determination prior to the M&R plan approval regarding the existence of an AVF and whether mining would or would not be permitted in that area of the tract.

Facilities Construction

The mining of this tract would utilize the existing Eagle Butte Mine facilities. No new railroad spur or power and telephone lines would be needed. There would be no additional water requirements.

Mining Operations

The addition of this proposed tract would increase the mine life of Eagle Butte Mine by about 5 years. This action would not affect employment. A production rate of 20 million tons per year would continue until this extension is mined out.

Mining sequence is shown on Map 1.2-3.

Approximately 2,000 unit trains annually would be required to ship the coal to market during this 5-year period. A unit train is 100 cars containing 100 tons each. About 100 acres of vegetation and soils would be disturbed annually.

Figure 1.2-1

POWDER RIVER REGION

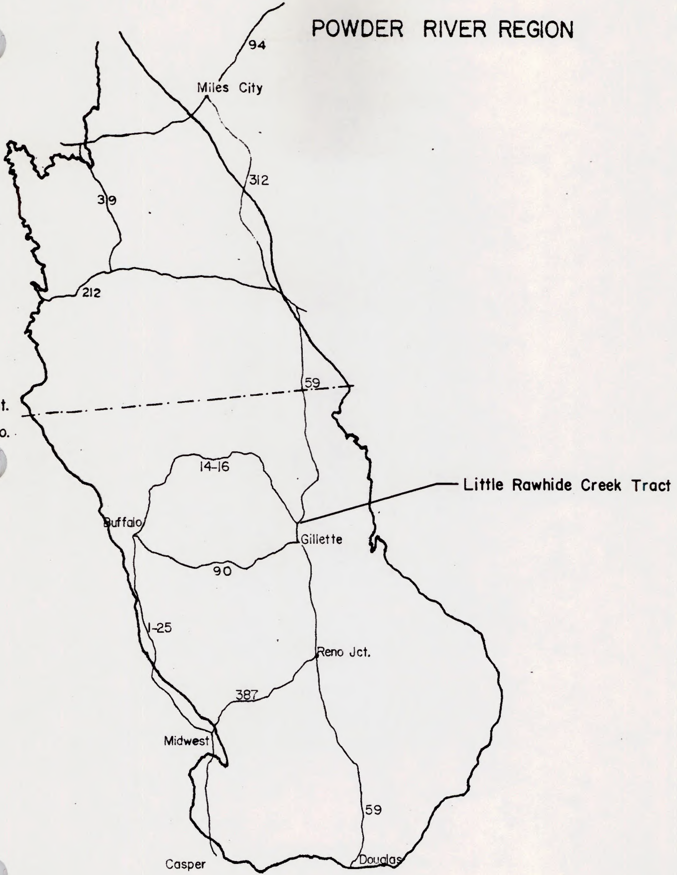


FIGURE 1.2-1

Little Rawhide Creek

Legal description

T. 51 N, R. 72 W,

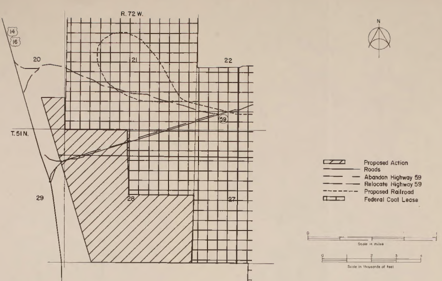
Sec. 20: All of that part of the SE 1/4 SE 1/4 lying east of a line 600 feet east of and parallel to the eastern right-of-way boundary of U.S. Highways 14 and 16.

Sec. 28: All of that part of the SW 1/4 lying east of a line 600 feet east of and parallel to the eastern right-of-way boundary of U.S. Highways 14 and 16.

All of the part of the NW 1/4 lying east of a line 600 feet east of and parallel to the eastern right-of-way boundary of U.S. Highways 14 and 16.

SE 1/4

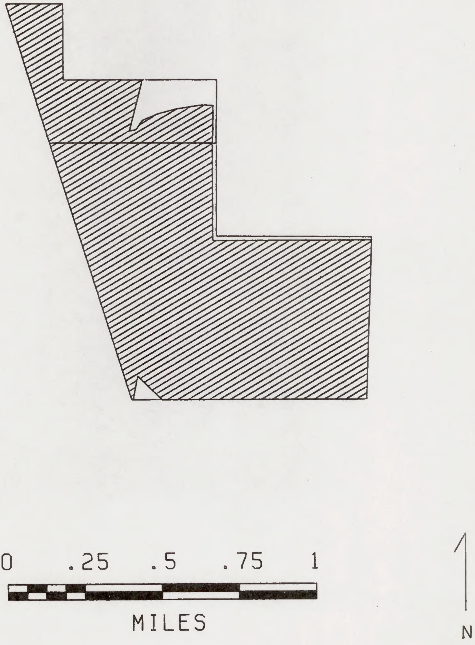
Sec. 29: All of the part of the E 1/2 NE 1/4 lying east of a line 600 feet east of and parallel to the eastern right-of-way boundary of U.S. Highways 14 and 16.



Map 1.2-1
LITTLE RAWHIDE CREEK

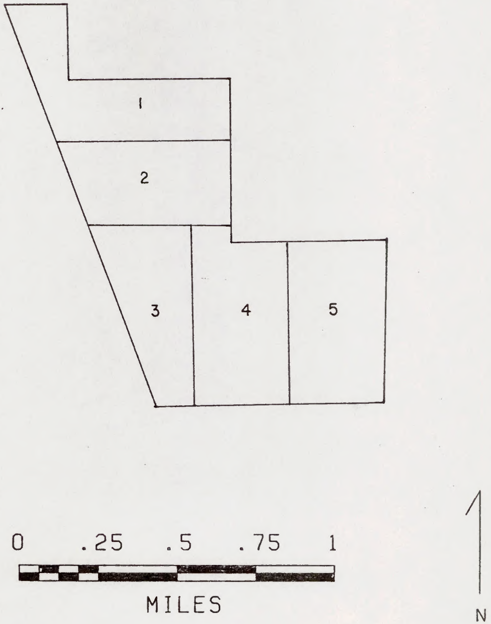
Map 1.2-2

LITTLE RAWHIDE CREEK: POSSIBLE ALLUVIAL VALLEY FLOORS



Map 1.2-3

LITTLE RAWHIDE CREEK: PROPOSED MINING SEQUENCE



Abandonment

Abandonment would be in accordance with 30 CFR 780. Postmining land use would be at the discretion of the surface owners, but would probably be grazing. Any structures left on the site after mining would be compatible with the postmining land use. Abandonment would entail removing any salvage material (i.e., rails from railroad spurs, scrap from mining buildings) and burying the remaining material. The final pit would be backfilled, subsoil and topsoil cut replaced, and the entire area seeded with a permanent mixture made up of grasses and forbs. The tract would be reclaimed within approximately 5 years after abandonment.

2. AFFECTED ENVIRONMENT

The environment that currently exists and changes anticipated from ongoing trends are included in this section. Information is restricted to that information required to assess significant impacts.

Geology and Topography

There are no major faults in the area and it is classified as aseismic (no tendency for earthquakes) (Simon, 1972). The geologic formations affected in this area are the upper part of the Fort Union, which contains the economic coal, and the lower part of the Wasatch, which overlies the Fort Union. Fossil leaves and invertebrates are common in both the Fort Union and Wasatch, while significant vertebrate fossils are rare and found in only a few locations in the Wasatch (BLM, Eastern Powder River Coal ES, 1979).

The tract consists of flatlands with the highest elevation of about 4,345 feet in the southwest corner and the lowest elevation of about 4,250 feet in the northeast corner. See Map 2-1.

Soils and Vegetation

Soils in the tract fall within a single soil association, which is the Renohill-Maysdorf-Ulm. This association is characterized by moderately deep to deep, well drained, loamy, sandy, and clayey soils on level to nearly level alluvial fans and sloping to steep uplands (BLM, Eastern Powder River Coal ES, 1979). The erosion potential of the soils is moderate to high and the salinity i s low (see soil matrix). The soils have a "good" reclamation potential based on reclamation of similar soils on the Wyodak Mine. The good category means that on a scale of 1 to 10 this tract rates an 8. Seven of the eight mines in the area rated fairly good or better in reclamation attempts. "Fairly good" is a 7 on a scale of 1 to 10 (Packer, 1974).

Vegetation on the tract ranges from sagebrush grasslands to grasslands with a very low density of sage. The vegetation types along with the average productivity, the common species, and the acreage of the various types by tract and review area are shown on Map 2-2 and Table 2-1.

Water Resources

Ground Water

The Wyodak coal is the only persistent shallow aquifer underlying the entire tract. Wells tapping these shallow aquifers typically yield less than 25 gallons per minute (gpm), although yields of more than 100 gpm would be obtained from wells 1,000 to 2,000 feet deep that are perforated for all water-yielding zones.

The entire tract is in a ground water recharge area characterized by downward movement of water so that the static water level in a well (the level at which water stands when the well is not pumped) drops progressively with increasing depth. Thus, pumping lifts in the deeper wells are several hundred feet more than in nearby shallow wells.

Field observations show a total of eight wells on and adjacent to the tract. Of these four are used for municipal supplies at Rawhide Village subdivision and at

[illegible]

[illegible] changes [illegible] Suggestion is [illegible] Required to [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible] of water [illegible]

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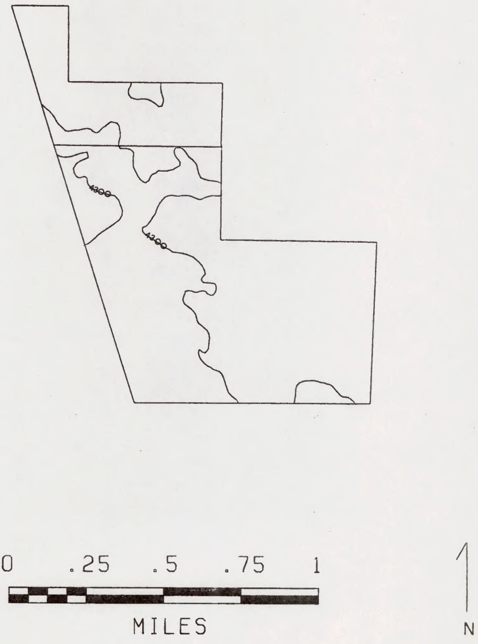
Map 2-1

LITTLE RAWHIDE CREEK: TOPOGRAPHY



Map 2-2

LITTLE RAWHIDE CREEK : VEGETATION

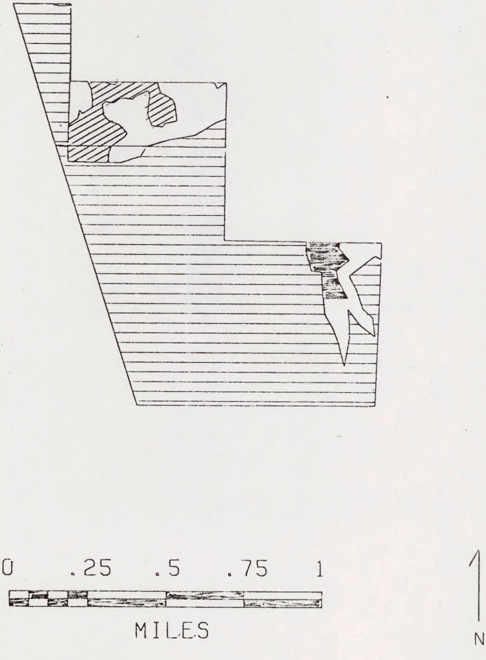


Table 2-1

VEGETATION: LITTLE RAWHIDE CREEK

Vegetation Type	Acreage In Tract	Acreage In Review Areas	Average Productivity
7.1	57.32	563,381.62	425 lbs/acre
9.1	26.64	106,553.25	770 " "
NC	382.03	107,666.92	
RY	9.74	1,389.03	

LEGEND:

▭	7.1	Open Sagebrush/Herbaceous
▨	9.1	Open Upland Herbaceous/Scattered Sagebrush
▤	NC	Non-Irrigated Croplands
■	RY	Ranch Yard

Little Rawhide

7.1 Open Sagebrush with Herbaceous

Cover: Shrubs w/20-80%, herbs > 20%, trees < 2%
Productivity: Herbaceous 425 lbs/acre
Species:
Big Sagebrush (*Artemisia tridentata* Nutt.)
Fringed sage (*Artemisia frigida* Willd.)
Snakeweek (*Gutierrezia sarothrae* (Pursh.) Britt. & Rusby)
Prickley pear (*Opuntia polycantha* Haw.)
Western wheatgrass (*Agropyron smithii* Rydb.)
Needle and thread grass (*Stipa comata* Trin. & Rupr.)
Sandbergs bluegrass (*Poa secunda* Presl.)
June grass (*Koeleria cristata* (L.) Pers.)

9.1 Open Herbaceous with Scattered Sage

Cover: Herbs w/20-80%, shrubs < 20%, trees <2%
Productivity: Herbaceous 770 lbs./acre
Species:
Big sagebrush
Fringed sage
Hookers sandwort (*Arenaria hookeri* Nutt. ex T. & G.)
Western wheatgrass
June grass
Blue grama (*Bouteloua gracilis* (H.V.K.) Lag.)
Needle and thread grass

Prospector Village trailer court, and two are used for domestic and stock supplies at farms and ranches, and one is used to supply water for livestock and wildlife.

Surface Water

The tract drains northward and westward to Little Rawhide Creek, which in turn drains northward to Rawhide Creek and the Little Powder River. All streams on the tract are ephemeral. Little Rawhide Creek at the north edge of the tract is intermittent and contains standing pools of poor quality water.

Average annual runoff from the tract should not greatly exceed 15 acre-feet per year.

Annual sediment yield from the tract using the Pacific Southwest Interagency Committee (PSIAC) method is estimated to be 0.2 to 0.3 acre-feet per square mile per year.

Water retained in existing reservoirs in this general area indicates that surface runoff from the tract would be generally good quality.

Alluvial Valley Floors

Shallow ground water exists and thus subirrigation appears to be occurring locally in the bottom of Little Rawhide Creek immediately north of the tract, but no subirrigation or flood-water irrigation appears to be occurring anywhere on the tract.

Land Ownership and Use

The surface is privately owned; coal is federally owned and oil and gas is both privately and federally owned. There is 84 acres of rangeland and 382 acres of non-irrigated cropland. For average crop production in Campbell County refer to Table 3.2-1.

Table 2-2 shows the number of non-energy related landowners, the amount of acreage they own on the tract and its relationship to the total acres owned.

Table 2-2
Non-Energy Related Landowners

Landowners	Acres Owned on Tract	Relationship to Total Acres Owned
1	42	5%
2	215	55%

There is one occupied residence on the tract.

Antelope and deer hunting is essentially the only recreational use made on the tract. Since the surface is privately owned, hunting is by landowner permission only. There is no information available to confirm this use.

The tract falls within antelope hunt area 17 and deer hunt area 18, as designated by the Wyoming Game and Fish Department. About 1,300 hunters use area 18 and area 17 annually harvesting about 750 deer and 1,000 antelope.

Wildlife

Antelope are the only big game species commonly found on the tract area. The majority of the tract area lies within antelope hunt area 19.

Antelope use the tract mostly in the spring and fall. Use is mainly confined to winter wheat during its germination and spring green periods. Because the tract is mainly cultivated and split by Highway 59, the habitat value of the tract is only fair for antelope use.

Small mammal, songbird, reptile and amphibian density is low. Cultivated land on the tract provides few niches for these classes of wildlife. For a summary of those species likely to be present on the tract see the Eagle Butte Mining and Reclamation Plan (Amax, 1977).

Cultural Resources

No inventory for cultural resources has been conducted on this tract. Inventory would take place during the M&R plan development period. During that time, significance of any identified cultural resources would be determined and appropriate measures taken.

Noise

The existing noise sources on the tract are wind, agricultural activity, traffic, and mining activity. The noise level is approximately 59 decibels (dB) (BLM, Eastern Powder River ES, 1979; USGS, Proposed Mining and Reclamation Plan, Pronghorn Mine Campbell County, Wyoming, 1979). This noise level is equivalent to typical office noise.

Climate and Air Quality

The minimum and maximum monthly average temperatures at Gillette are 21° and 69°F; average growing season is 111 days. Winds are predominately from the SEE to SSW (37 percent) and the NNW to N (21.3 percent). Winds are stronger than 11.5 mph about 23 percent of the time. The annual average rainfall is about 15.5 inches; average annual snowfall is about 65 inches. Although there are no topographic restrictions to pollutant dispersion, the tract frequently experiences such meteorological conditions as low mixing heights, low windspeed, and no precipitation, which hinder pollutant dispersion.

The air quality in the region is generally very good. The background level of particulate is estimated to be about 15 ug/m^3 average geometric mean; however, particulate levels increase to levels approaching the state standard of 60 ug/m^3 near existing mines. Little monitoring of gaseous pollutants occurs, but levels are estimated to be quite low. Visibility exceeds 25 miles 76 percent of the time (Sheridan).

Average monthly visibility ranges from 26 to 47 miles. Visibilities of 60 miles or greater are fairly common (PEDCo., 1980).

Transportation

The nearest roads are U.S. Highway 14-16 and State Highway 59. Both highways are paved and two-lanes. Highway 14-16 runs north-south. Highway 59 branches east off of Highway 14-16 for about 2 1/2 miles before turning north. The extension comes right along the east side of Highway 14-16, while the first 3/4 mile of Highway 59 cuts across the extension area. The railroad spur to the Eagle Butte Mine lies about 1/2 mile to the north.

Socio-Economics

The analysis in this section is based on the assumption that the economic trends and forces that have shaped the regional economy since 1970 will remain constant. In addition, the analysis of trends is designed to highlight probable, permanent change and may not provide insight into major construction booms in the region such as that faced by Converse County.

The region most likely to be affected economically by a decision to lease federal coal in the Wyoming section of the Powder River Region consists of seven counties: Campbell, Converse, Crook, Johnson, Natrona, Sheridan, and Weston. Of the seven counties, Campbell, Converse, and Sheridan counties had operational coal mines situated within their boundaries in 1979. The probability is high that Johnson County will host an operational coal mine within 10 years. Tables 2-3 through 2-7 provide an overview of coal development, labor force, employment, annual wage levels, and population for the region as the existing scenario through 1979 and as a trended scenario through 1995. Of particular interest is the negative labor force residuals in Table 2-4 for years 1975 to 1977 in Campbell County and 1979 in Natrona County. The magnitude of the number is probably of little consequence, but the implication is that some part of the employed working force, in that respective county and time frame, actually resided in another county or another state. Therefore, the job held by the "commuter" did not result in increased population for the county of employment at that time. Table 2-8 presents an estimate of 1979 population and the actual levels of existing community services available in the region in 1979. Tables 2-9 through 2-11 present an estimate of additional population for 1985, 1990, and 1995 and an estimate of the added levels of community services that would be required to maintain community standards at 1979 levels. All changes are anticipated without the proposed action and are presented in cumulative form. Changes through 1985 are included in changes through 1990, and changes through both 1985 and 1990 are included in changes through 1995.

Attitudes

The area that would receive the heaviest sociological impacts due to the proposed action would be Campbell County and the City of Gillette. A general understanding of attitudes must be attained with the knowledge that between 1960 and 1980 Campbell County's population increased by a factor of 4.2. This rapid increase in population means that most conflicts between new and old populations have already occurred and future significant conflicts would not arise.

Preliminary analysis of portions of the social survey, conducted in Campbell County from July to September 1980, indicates that an overwhelming majority of the respondents favor leasing of federal coal. Out of 137 interviews, 106 favor coal leasing, 5 are against leasing and 13 are in favor on a conditional basis.

Favorability toward coal leasing does not imply lack of concern with respect to additional coal development. The primary concern centers on the land being reclaimed after mining. Also, impacts from influx of population rates high on the list of concerns (24 responses out of 137).

The people interviewed saw no problem with more mining in Campbell County, and they cited many beneficial impacts of mining more federal coal. Concern over which was more important, environmental or social impacts, ran about equal.

Table 2-3

Potential Coal Development 1/
Wyoming Powder River Region

	Total Acres to be Disturbed	Acres to be Disturbed Annually	Recoverable Reserves (Million Tons)	Annual Production (000 Tons)			
				1979 2/	1985	1990	1995
Campbell County							
xisting Mines							
Bell Ayre	5,960	260	331.0	14,997	19,000	19,000	19,000
Black Thunder	7,300	183	745.0	6,244	20,000	20,000	20,000
Caballo	3,338	100	818.0	1,273	7,500	12,000	12,000
Clovis Point	730	41	68.0	293	4,000	4,000	4,000
Cordero	6,640	230	521.0	3,833	15,000	15,000	24,000
Eagle Butte	3,418	260	200.0	3,733	19,000	20,000	---
Ft. Union	400	29	15.6	8	1,200	1,200	---
Jacobs Ranch	4,960	198	319.0	4,681	14,000	14,000	14,000
Rawhide	4,921	136	734.0	3,593	24,000	24,000	24,000
Wyodak	2,143	60	180.1	2,364	5,000	5,000	5,000
Subtotal	39,810	1,497	3,931.0	41,019	128,700	134,200	122,000
otential Mines							
Antelope	5,819	193	285.0	---	10,000	10,000	10,000
Buckskin	1,500	115	43.0	---	6,200	1,500	---
Coal Creek	6,700	176	356.0	---	8,500	10,000	10,000
Dry Fork	Not Avail.	Not Avail.	300.0	---	2,000	8,000	15,000
East Gillette	2,025	78	284.0	---	11,000	11,000	11,000
Pronghorn	1,258	55	97.0	---	5,000	5,000	5,000
Rojo Caballos	3,919	151	320.0	---	9,000	15,000	15,000
South Rawhide	2,881	68	275.0	---	4,000	7,000	7,000
Wildcat Creek	1,933	84	220.0	---	5,250	10,000	10,000
Subtotal	26,035	920	2,180.0	---	60,950	77,500	83,000
RLAs	57,205	2,472	2,828.8	---	---	12,220	55,030
RLA Related	15,960	364	649.6	---	---	6,250	14,240
ounty Total	139,010	5,253	9,589.4	41,019	189,650	230,170	274,270

Table 2-3

Potential Coal Development 1/ Wyoming Powder River Region (Continued)

	Total Acres to be Disturbed	Acres to be Disturbed Annually	Recoverable Reserves (Million Tons)	Annual Production (000 Tons) 1979 2/	1985	1990	1995
Converse County							
Existing Mines							
Dave Johnstone Mine	4,500	200	71.0	3,828	3,200	3,200	3,200
Potential Mines							
Antelope	5,757	221	285.0	---	8,000	10,000	12,000
PRLAs	21,764	1,030	203.7	---	---	6,850	10,140
PRLAs Related	1,280	85	30.8	---	---	2,148	2,288
County Total	33,301	1,536	590.5	3,828	11,200	22,198	27,628
Johnson County							
Potential Mines							
Texeco Lake DeSmet	30,000	125	2,000.0	---	---	6,800	15,300
Sheridan County							
Existing Mines							
Big Horn	800	38	95.2	3,524	4,500	4,500	4,500
Potential Mines							
Black Mtn. Mine	400	40	5.0	8	500	500	---
Dutchman Mine	960	32	60.0	---	2,000	2,000	2,000
PSO Mine #1	160	8	10.0	---	500	500	500
Subtotal	2,320	118	170.2	3,532	7,500	7,500	7,000

Table 2-3

Potential Coal Development 1/
Wyoming Powder River Region
(Continued)

	Total Acres to be Disturbed	Acres to be Disturbed Annually	Recoverable Reserves (Million Tons)	Annual Production (000 Tons)			
				1979 2/	1985	1990	1995
Johnson & Sheridan Counties							
PRLAs	18,921	544	1,268.2	---	---	5,100	15,000
PRLA Related	30,000	750	480.0	---	---	12,000	12,000
Subtotal	48,921	1,294	1,748.2	---	---	17,100	27,000
Grand Totals	253,552	8,326	14,098.3	48,379	208,350	283,768	351,198

1/ Casper District Office estimates, based or information obtained from Wyoming Department of Economic Planning & Development, and Industrial Mining Plans or initial showings.

2/ Actual Production.

Table 2-4

Adjusted April Employment Statistics for Wyoming and the Seven-County Powder River Region

County/Labor Component	1972	1973	1974	1975	1976	1977	1978	1979
Campbell								
Labor Force 1/	4,420	4,308	4,680	5,956	7,270	9,045	11,628	12,764
Employment 2/ 3/	3,937	3,823	4,273	5,890	7,097	9,610	10,569	11,911
Unemployment	119	131	128	172	249	247	346	330
Labor Force 3/ Residual	364	354	279	-106	-76	-809	713	523
Converse								
Labor Force 1/	2,840	2,678	3,114	3,702	4,282	5,042	5,850	6,357
Employment 2/ 3/	1,755	1,684	2,048	2,630	3,140	3,608	4,293	4,734
Unemployment	83	66	73	91	70	120	136	84
Labor Force 3/ Residual	1,002	928	993	981	1,072	1,314	1,421	1,539
Crook								
Labor Force 1/	1,602	1,714	1,832	1,868	2,149	2,221	2,404	2,382
Employment 2/ 3/	828	1,002	1,020	1,093	1,286	1,303	1,490	1,436
Unemployment	79	44	55	61	58	78	47	42
Labor Force 3/ Residual	695	668	757	714	805	840	867	904
Johnson								
Labor Force 1/	2,047	2,102	2,418	2,658	2,761	2,607	3,093	3,223
Employment 2/ 3/	1,058	1,295	1,464	1,687	1,728	1,596	1,949	2,045
Unemployment	74	76	64	87	100	66	75	58
Labor Force 3/ Residual	915	731	890	884	933	945	1,069	1,120
Natrona								
Labor Force 1/	20,029	21,224	22,843	25,611	27,094	29,608	34,329	35,783
Employment 2/ 3/	18,198	19,664	21,355	24,317	25,723	28,403	32,923	35,113
Unemployment	674	514	622	931	779	693	799	734
Labor Force 3/ Residual	1,157	1,046	866	363	592	512	607	-64

Table 2-4

Adjusted
April Employment Statistics
for Wyoming and the Seven-County
Powder River Region

(Continued)

County/Labor Component	1972	1973	1974	1975	1976	1977	1978	1979
Sheridan								
Labor Force 1/	7,013	7,018	7,556	7,605	8,615	9,274	9,974	10,219
Employment 2/ 3/	4,636	4,615	5,167	5,284	6,157	6,341	7,321	7,771
Unemployment	308	291	329	365	380	317	362	238
Labor Force 3/ Residual	2,069	2,112	2,060	1,956	2,078	2,616	2,291	2,210
Weston								
Labor Force 1/	2,391	2,286	2,491	2,542	2,604	2,702	2,729	3,107
Employment 2/ 3/	1,589	1,531	1,695	1,704	1,673	1,892	2,050	2,504
Unemployment	143	80	73	108	111	105	86	78
Labor Force 3/ Residual	659	675	723	730	820	705	593	525
ven County Region								
Labor Force 1/	40,342	41,330	44,934	49,942	54,775	60,559	70,007	73,835
Employment 2/ 3/	32,001	33,614	37,022	42,605	46,804	52,753	60,595	65,514
Unemployment	1,480	1,202	1,344	1,815	1,747	1,626	1,851	1,564
Labor Force 3/ Residual	6,861	6,514	6,568	5,522	6,224	6,120	7,561	6,757

1/ Labor force defined as all 16 years or over who are either employed or actively seeking employment. Counted at place of residence.

2/ Counted at place of work.

3/ Employment figures for 1972 through 1977 have been adjusted to provide comparability to employment data published after January 1, 1978, when coverage of the Employment Security law was expanded.

Table 2-5

Trends In Employment For the Wyoming Seven-County Powder River Region 1/

	1975	1979	1985	1990	1995
Campbell County					
Coal Employment	Unknown	1,672	3,800- 7,500	4,500- 9,000	6,000-10,500
Other Mining Employment	1,368	1,721	1,900- 2,600	2,400- 3,100	2,900- 3,700
All Other Employment	4,522	8,518	10,000-15,000	14,000-18,000	17,000-22,000
Total Employment	5,890	11,911	15,700-25,100	20,900-30,100	25,900-36,200
Converse County					
Coal Employment	Unknown	155	400- 1,100	500- 1,500	500- 1,500
Other Mining Employment	659	1,378	1,800- 2,700	2,600- 3,500	3,300- 4,300
All Other Employment	1,971	3,201	3,600- 5,000	4,700- 6,500	6,000- 7,500
Total Employment	2,630	4,734	5,800- 8,800	7,800-11,500	9,800-13,300
Crook County					
Coal Employment	---	---	---	---	---
Other Mining Employment	152	394	400- 700	600- 800	800- 1,000
All Other Employment	941	1,042	1,200- 1,400	1,400- 1,600	1,600- 1,800
Total Employment	1,093	1,436	1,600- 2,100	2,000- 2,400	2,400- 2,800
Johnson County					
Coal Employment	---	---	---	200- 500	500- 1,100
Other Mining Employment	180	335	300- 500	500- 600	600- 800
All Other Employment	1,507	1,710	1,900- 2,600	2,400- 3,100	2,900- 3,600
Total Employment	1,687	2,045	2,200- 3,100	3,100- 4,200	4,000- 5,500

Table 2-5

Trends in Employment
For the Wyoming Seven-County
Powder River Region 1/
(Continued)

	1975	1979	1985	1990	1995
Natrona County					
Coal Employment	---	---	---	---	---
Other Mining Employment	3,825	6,672	8,000-11,000	10,000-13,000	12,000-15,000
All Other Employment	21,786	29,111	31,000-42,000	39,000-50,000	47,000-58,000
Total Employment	25,611	35,783	39,000-53,000	49,000-63,000	59,000-73,000
Sheridan County					
Coal Employment	Unknown	302	100- 800	100- 900	100- 900
Other Mining Employment	147	51	---	---	---
All Other Employment	5,137	7,418	8,000-11,000	10,000-13,000	12,000-15,000
Total Employment	5,284	7,771	8,100-11,800	10,100-13,900	12,100-15,800
Weston County					
Coal Employment	---	---	---	---	---
Other Mining Employment	477	535	500- 700	600- 700	700- 800
All Other Employment	1,227	1,969	1,800- 2,500	2,200- 2,900	2,600- 3,300
Total Employment	1,704	2,504	2,300- 3,200	2,800- 3,600	3,300- 4,100

Table 2-5

Trends in Employment For the Wyoming Seven-County Powder River Region 1/ (Continued)

Seven-County Region	1975	1979	1985	1990	1995
Coal Employment	Unknown	2,129	4,300- 9,400	5,300- 11,900	7,100- 14,000
Other Mining Employment	6,808	11,086	12,900- 18,200	16,700- 21,700	20,300- 25,600
All Other Employment	37,091	52,969	57,500- 79,500	73,700- 95,100	89,100-111,200
Total Employment	43,899	66,184	74,700-107,100	95,700-128,700	116,500-150,800

1/ Based on April employment statistics obtained from the Wyoming Employment Security Commission. Data for 1975 was adjusted by Casper District Office to provide comparability to data published after 1978 because of change in coverage of the Employment Security Law. County coal employment for 1975 was not available.

Table 2-6

Trend In Annual Wages
Based on April Weekly Wages and Employment
Wyoming Seven-County Region
(In Millions of Dollars, Unadjusted for Inflation)

County	1975	1979	1985	1990	1995
Campbell					
Mining	20.30	77.18	190- 340	290- 510	450- 720
All Other	31.75	112.23	200- 300	350- 450	510- 660
Total	52.05	189.41	390- 640	640- 960	960-1,380
Converse					
Mining	8.94	32.92	70- 110	120- 190	170- 260
All Other	14.36	36.67	60- 80	100- 130	140- 180
Total	23.30	69.59	130- 190	220- 320	310- 440
Crook					
Mining	1.57	6.48	9- 15	16- 21	25- 32
All Other	3.73	11.24	18- 21	26- 29	35- 40
Total	5.30	17.72	27- 36	42- 50	60- 72
Johnson					
Mining	2.46	5.54	7- 12	22- 34	41- 70
All Other	8.68	16.68	25- 34	39- 50	56- 69
Total	11.14	22.22	32- 46	61- 84	97- 139
Natrona					
Mining	64.77	141.43	230- 320	360- 470	520- 640
All Other	154.39	392.97	590- 780	920-1,200	1,300-1,600
Total	219.16	534.40	820-1,100	1,280-1,670	1,820-2,240
Sheridan					
Mining	1.87	8.81	4- 28	5- 41	6- 50
All Other	29.73	80.62	120- 160	180- 230	260- 320
Total	31.60	89.43	124- 188	185- 271	266- 370

Table 2-6

Trend In Annual Wages
Based on April Weekly Wages and Employment
Wyoming Seven-County Region
(In Millions of Dollars, Unadjusted for Inflation)

(Continued)

County	1975	1979	1985	1990	1995
Weston					
Mining	5.81	9.20	12- 17	18- 22	26- 29
All Other	7.87	22.26	28- 39	42- 55	59- 75
Total	13.68	31.46	40- 56	60- 77	85- 104
Seven-County Region					
Mining	105.72	281.56	522- 842	831-1,288	1,238-1,801
All Other	250.51	672.67	1,041-1,414	1,657-2,144	2,360-2,944
Total	356.23	954.23	1,563-2,256	2,488-3,432	3,598-4,745

Table 2-7

Trends in Population
For the Wyoming Seven-County
Powder River Region

County/Community	1970	1980	1985	1990	1995
Campbell	12,957	24,363	28,000- 41,000	35,000- 47,000	42,000- 56,000
Gillette	7,194	12,125	14,000- 20,000	18,000- 24,000	21,000- 28,000
Converse	5,938	14,025	14,025- 19,000	17,000- 24,000	21,000- 27,000
Douglas	2,677	6,009	6,009- 8,200	7,500- 10,200	8,900- 11,600
Glenrock	1,515	2,738	2,738- 3,700	3,400- 4,700	4,100- 5,300
Crook	4,535	5,303	5,600- 6,400	6,200- 6,900	6,900- 7,500
Sundance	1,056	1,085	1,140- 1,310	1,270- 1,410	1,410- 1,540
Moorcroft	981	1,011	1,060- 1,220	1,190- 1,310	1,310- 1,440
Johnson	5,587	6,714	6,800- 7,800	7,800- 9,000	8,800- 10,500
Buffalo	3,394	3,798	3,860- 4,420	4,420- 5,100	4,980- 5,920
Natrona	51,264	71,589	74,000- 88,000	84,000- 98,000	94,000-108,000
Casper	39,361	50,704	52,000- 62,000	59,000- 69,000	67,000- 77,000
Sheridan	17,852	25,025	25,025- 32,000	29,000- 36,000	32,000- 39,000
Sheridan	10,856	15,136	15,136- 19,000	17,000- 22,000	20,000- 24,000
Weston	6,307	7,105	7,105- 7,800	7,500- 8,200	7,900- 8,600
Newcastle	3,432	3,584	3,584- 3,900	3,800- 4,100	4,000- 4,300
Seven-County Total	104,440	154,124	160,555-202,000	186,500 - 229,100	212,600-256,000

Table 2-8

Existing Levels of Community Services in 1979

COUNTY/COMMUNITY	Population 1/	School Enrollment	Dwelling Units 1/	Required Fire Pumping Capacity (gallons per minute)	Water System Capacity (million gallons daily)	Sewage Treatment Capacity (million gallons daily)	Unused Landfill Capacity (acres)	Police Officers	Social Workers	Hospital Beds
Campbell	23,200		8,950					25	4	31
Gillette	11,560	5,116	4,650	4,350	3.6[2]	1.70[2]	2.4[2]	31		
Converse	13,200		5,050					9	2	32
Douglas	5,660	2,016	2,210	2,887	3.5	.30[3]	120.0	11		
Crook	5,200	1,223	2,340					4	1	16
Moorcroft	995	475	415	1,500	.3[4]	.14[4]	10.0	3		
Johnson	6,600	1,484	2,960					8	1	35
Buffalo	3,730	1,239	1,635	2,100	4.0	.63[5]	13.0	7		
Natrona	69,600	13,946	27,200					50	13[6]	282
Casper	49,270	13,339	19,400	6,750[7]	12.0	6.5	90.0	74		
eridan	24,300	4,650[1]	10,500					9	4	97
Sheridan	14,700	3,690[1]	6,380	3,733	10.0	5.0	0.0	27		
Weston	7,020	1,229	2,830					4	2[7]	39
Newcastle	3,540		1,420	2,250	.7	2.0	2.0	10		

1/ Casper District Office estimates.

2/ The City of Gillette will have an additional 10.1 mgd of water in 1981 after completion of the Madison Project. In addition, a 201 study has been undertaken to provide for construction of sewage treatment facilities with 7.4 mgd capacity, and arrangements are being made to purchase a landfill site which would be adequate for 20 years.

3/ A new sewage system is scheduled to be completed in Douglas by 1984.

4/ Moorcroft recognized that it is at capacity with water service, but hopes to obtain water from Gillette's Madison Project. The city also recognized the limits of the sewage system and is seeking funding for improvements.

5/ Buffalo's sewage treatment facility is to be rebuilt between 1981 and 1983.

6/ State employees only. Various agencies employ other social workers.

7/ Casper District Office estimate of 1979 requirement.

Table 2-9

1985

Changes and Additional Community Services Required to Maintain 1979 Standards (1985-1979)

COUNTY/COMMUNITY	Additional Population	Additional School Enrollment	Additional Dwelling Units Needed	Required Additional Fire Pumping Capacity (gpm)	Additional Water System Capacity Needed (mgd)	Additional Sewage Treatment Capacity Needed (mgd)	Additional Landfill Required (acres/year)	Additional Police Officers Required	Additional Social Workers Required	Additional Hospital Beds Required
Campbell	4,800–17,800		1,850–6,870					5–20	1–3	7–24
Gillette	2,400–8,400	850–2,960	960–3,370	0–0	.75–2.60	.40–1.20	1.9–2.8	7–23		
Converse	800–5,800		310–2,220					1–4	1–1	2–14
Douglas	300–2,500	330–1,260	120–980	0–0	.20–1.50	.02–.13	0.0–0.0	1–5		
ok	400–1,200	50–210	180–540					1–1	0–1	1–4
Moorcroft	60–200	20–80	25–80	0–0	.02–.06	.01–.03	0.0–0.0	1–1		
Johnson	200–1,200	80–520	90–540					1–2	0–1	1–6
Buffalo	100–700	60–430	40–310	0–10	.10–.80	.02–.10	2.7–3.1	1–2		
Natrona	4,400–18,400	270–1,450	1,720–7,190					4–14	1–4	18–75
Casper	2,700–12,700	260–1,380	1,060–5,000	50–600	.70–3.10	.36–1.70	16.0–18.9	4–19		
Sheridan	700–7,700	60–110	300–3,300					1–3	1–2	3–31
Sheridan	400–4,300	50–90	170–1,900	30–470	.30–2.90	.14–1.50	5.0–6.0	1–8		
Weston	100–800	0–107	40–320					0–1	0–1	1–4
Newcastle	50–400		20–160	0–0	.01–.08	.03–.23	1.0–1.1	1–2		

Table 2-10

1990
Changes and Additional Community Services Required to Maintain 1979 Standards
(1990-1979)

COUNTY/COMMUNITY	Additional Population	Additional School Enrollment	Additional Dwelling Units Needed	Required Additional Fire Pumping Capacity (gpm)	Additional Water System Capacity Needed (mgd)	Additional Sewage Treatment Capacity Needed (mgd)	Additional Landfill Required (acres/year)	Additional Police Officers Required	Additional Social Workers Required	Additional Hospital Beds Required
Campbell	11,800-23,800		4,560-9,190					13-26	2-5	16-32
Gillette	6,400-12,400	2,020-4,080	2,570-4,980	0-350	2.00-3.90	.90-1.80	2.5-3.3	18-34		
Converse	3,800-10,800		1,460-4,140					3-8	1-2	9-26
Douglas	1,800-4,500	950-2,100	700-1,760	0-140	1.10-2.80	.10-.24	0.0-0.0	4-9		
ok	1,000-1,700	180-300	450-760					1-2	1-1	3-5
Moorcroft	200-300	70-120	80-130	0-0	.02-.09	.03 .04	0.0-0.0	1-1		
Johnson	1,200-2,400	520-1,080	540-1,080					2-3	1-1	6-13
Buffalo	700-1,400	430-900	310-610	10-180	.80-1.50	.10-.24	3.1-3.6	2-3		
Natrona	14,400-28,400	1,110-2,290	5,600-11,090					10-21	3-6	58-115
Casper	9,700-19,700	1,060-2,190	3,800-7,800	450-950	2.40-4.80	1.30-2.60	18.0-21.0	15-30		
Sheridan	4,700-11,700	410-1,080	2,000-5,100					2-4	1-2	19-47
Sheridan	2,300-7,300	330-860	1,000-3,200	270-770	1.60-5.00	.78-2.50	5.7-7.3	5-14		
Weston	500-1,200	50-170	200-480					1-1	1-1	3-7
Newcastle	300-600		120-240	0-0	.06-.12	.17-.34	1.1-1.2	1-2		

Table 2-11

1995
Changes and Additional Community Services Required to Maintain 1979 Standards (1995-1979)

COUNTY/COMMUNITY	Additional Population	Additional School Enrollment	Additional Dwelling Units Needed	Required Additional Fire Pumping Capacity (gpm)	Additional Water System Capacity Needed (mgd)	Additional Sewage Treatment Capacity Needed (mgd)	Additional Landfill Required (acres/year)	Additional Police Officers Required	Additional Social Workers Required	Additional Hospital Beds Required
Campbell	18,800-32,800		7,260-12,660					21-35	4-6	25-44
Gillette	9,400-16,400	3,140-5,450	3,780-6,590	0-730	2.90-5.10	1.40-2.40	2.90-3.90	25-44		
Converse	7,800-13,800		2,990-5,290					6-10	2-2	19-33
Douglas	3,200-5,900	1,570-2,660	1,250-2,300	0-370	2.00-3.60	.17-.30	0.00-0.00	7-12		
ok	1,700-2,300	300-430	770-340					2-2	1-1	5-7
Moorcroft	300-400	120-170	130-170	0-0	.09-.12	.04-.06	0.00-0.00	1-2		
Johnson	2,200-3,900	980-1,720	990-1,750					3-5	1-1	12-21
Buffalo	1,200-2,200	820-1,440	530-960	130-380	1.30-2.40	.20-.37	3.40-4.10	3-5		
Natrona	24,400-38,400	1,950-3,130	9,500-15,000					18-28	5-8	99-156
Casper	17,700-27,700	1,870-2,992	7,000-10,900	850-1,350	4.30-6.70	2.30-3.70	20.00-23.00	27-42		
Sheridan	7,700-14,700	770-1,420	3,300-6,400					3-6	1-3	31-59
Sheridan	5,300-9,300	610-1,130	2,300-4,000	570-970	3.60-6.30	1.80-3.20	6.70-8.00	10-17		
Weston	900-1,600	120-250	360-650					1-1	1-1	5-9
Newcastle	500-800		200-320	0-0	.10-.16	.28-.45	1.10-1.20	2-3		

3. ENVIRONMENTAL CONSEQUENCES

This section describes the significant environmental effects that would occur with implementaion of the proposed action including the alternatives. Such items as threatened and endangered plant and animal species, floodpains, and wilderness values have been considered and are deemed irrelevant for this tract. Also, negative declarations included in the matricies are not presented within the impacts in this section. Principal basis for the analysis is the professional judgments of the resource specialists, public and other agency input and related works, as referenced. And, when possible the impact has been quantified. A range of probability that the impact would occur has been used when appropriate. The range is defined in terms of percentage: 10-29 percent--the impact is considered highly unlikely to occur; 30-59 percent--the impact would not likely occur; 60-79 percent--the impact would probably occur; and, 80-100 percent--is highly probable. A percentage probability figure will be set in parenthesis with discussion of each impact.

3.1 No Action Alternative

Topography, soils, vegetation, water, wildlife, visual, noise, and air quality resources would not change under this alternative. An intensive inventory of cultural resources on the tract would be delayed for many years.

3.2 Proposed Action

Geology and Topography

Of the about 100 million tons of coal in-place, about 10 million tons would not be recovered by surface mining methods. About 90 million tons would be produced and used to help meet the nation's energy demand.

The topography of the tract would be altered after mining and reclamation according to the following general formula:

Overburden Thickness x 1.3 (Bulking Factor) minus Overburden Thickness + Coal Thickness

The bulking factor represents the amount of volume increase of the overburden when it is broken up after mining and an increase in void space occurs (BLM, WPRS, USGS, EMRIA Report No. 13, 1979). Applying this formula, the average elevation of the whole tract would decrease by about 50 feet, with the uniformity of the topography staying as it is at present.

Soils and Vegetation

Vegetation will be destroyed at the rate specified in the Alternatives icluding the proposed aciton section. During reclamation, federal and state regulations would govern, among other things, replacement of topsoil, seedbed preparation, and seed mixtures. As a result, productivity would increase and the dry matter productivity would double the premining productivity in about 5 years following initial reclamation (90 percent probability) (Packer, 1974; USGS, 1979). Assuming proper livestock management, species diversity would return to premining conditions by natural plant succession within about 30 years after reclamation.

Water Resources

Ground Water

Impacts would be minor on existing wells adjacent to the tract. Any excess water discharged from the pit into existing streams off site would be somewhat better quality than water currently moving through the alluvial aquifers underlying those streams. The proposed potable water supply from wells less than 1,600 feet in the lower Fort Union Formation would cause no significant impact on existing wells in the area.

Removal of the overburden aquifers would physically destroy ony one of the eight wells on and adjacent to the tract. The impact on the ground water supply would be a loss of water for livestock and wildlife at only one well currently in use. No impairment of the water supply would occur in any of the other wells in the area. Mining adjacent to the bottom of Little Rawhide Creek valley should have no significant impact on the alluvial aquifer underlying that stream and, therefore, should not eliminate the standing pools of water in the deeper potholes that are currently an important source of water for livestock and wildlife.

Replacement of all aquifers in the mined interval with a moderately permeable spoils aquifer would eliminate all shallow water on the tract and create a single tract-wide aquifer about 50 feet below the surface. Because of leaching of this spoils aquifer, the water would be a calcium magnesium, sulfate type. This water would be unsuitable for domestic use and marginal for use by livestock and wildlife. Although good quality water would be obtained anywhere on the tract by drilling to depths of 800 to 1,100 feet, the deeper wells would be much more expensive to drill initially and would require continuing higher pumping and maintenance costs because of higher pumping lifts.

Surface Water

Impacts to the surface water system would be short term and generally insignificant as no interception and use of runoff from the tract for ongoing mining operations would occur and no reservoirs exist in the mined area. As no incrased consumptive use of water would occur, the volume of water available to downstream users during the period of mining would not be significantly reduced.

Land Ownership and Use

The total acres removed from production would be 560: 168 acres of rangeland and 382 acres of non-irrigated cropland. Animal unit lost in grazing due to loss in rangeland would be 34.

The occupied residence would be removed or destroyed.

Wildlife

Antelope losses due to this mine extension would be minimal. Losses would be due to poaching and road kills, because of the two highways in or bordering the tract.

Tract development when considered along with the adjacent highway would present a barrier to movement. However, residential and industrial development exists from Gillette to approximately 1/2 mile south of the tract so there is little winter habitat south of the tract compared to the area as a whole.

Small mammals, songbirds, reptiles, and amphibians would be destroyed or displaced and enventually lost if the tract is mined. Losses would not be significant to local or regional populations.

Cultural Resources

All cultural sites upon the tract would be destroyed. A systematic collection and analysis of the information present in identified sites would add to our knowledge of past human use of this area (70 percent probability). However, unauthorized collection of artifacts, due to increased human activity and presence, would result in the reduction of the integrity of the resource (100 percent probability).

Visual Resources

Proposed mining would affect the landscape changing form, line, color, and texture. The disturbance during mine life would cause a VRM class change within the tract from IV to V and then a return from V to IV following reestablishment of vegetation. VRM class V disturbance is excessive and reclamation is needed to bring the area back to class IV (BLM 8400 VRM) (90 percent probability).

Noise

The zone of the affected environment would extend to the 50 db contour using the methods described in Planning in the Noise Environment (draft) (Department of Air Force, Army, and Navy, 1976). The 50 dB is equivalent to the noise level in a typical office. This zone would extend for approximately 1/3 mile around the tract. Because of the existing mine and the surrounding land use, the probability of adverse impacts within this zone is low (10 percent).

Climate and Air Quality

No change in air quality is expected as a result of an extension of the Eagle Butte Mine. However, for an additional 5 years, the increment presently being consumbed by the Eagle Butte Mine will not be available for other competing uses. Because there is already substantial competetion in teh Powder River Basin for the available increment, it must be determined if the mine extension is the best use of the increment based on air quality, economic, and other resource considerations.

Transportation

No new roads, railroad construction or significant traffic increases would result from mining this area. Impacts would remain about the same as for the present Eagle Butte Mine.

Socio-Economics

No new roads, railway construction or significant traffic increases would result from mining this area. Impacts would remain about the same as for the present Eagle Butte Mine.

There are two possible areas of economic concern in relation to the leasing of federal coal in the Wyoming Powder River Region. One is the possible impact to individuals involved. The other is the possible impact to society. The last may well be the only concern that is valid to the decision-making process at hand.

Analysis of the first, impacts to individuals, will focus attention on the landowner. The landowner of primary concern in the Wyoming Powder River Region is the farmer or rancher. The one major economic reality facing the modern-day farmer or rancher is the "cost-price squeeze." The "cost-price squeeze" implies high

Table 3.2-1

1978 Campbell County Crop Production Compared to Wyoming and U.S.

	Bushels Per Acre	Total Production (Million Bushels)
Barley		
Campbell County	36.0	.2
Wyoming	63.0	8.3
U.S.	48.4	447.0
Corn		
Campbell County	35.0	.007
Wyoming	81.0	2.8
U.S.	101.2	7,081.8
Oats		
Campbell County	38.3	.1
Wyoming	56.0	2.7
U.S.	52.2	601.5
Winter Wheat		
Campbell County	36.0	1.0
Wyoming	26.0	7.2
U.S.	32.1	1,248.3
All Hay	Tons Per Acre	Million Tons
Campbell County	1.30	.05
Wyoming	1.71	2.1
U.S.	2.31	142.3

Particularly noteworthy is the fact that the most significant crop produced in Campbell County in 1978, winter wheat, accounted for far less than 1 percent of the total U.S. production. Another factor concerning Campbell County agriculture is that the most extensive use of agricultural land is for livestock grazing; however, the land is such that an excess of 40 acres may be required to support 1 animal unit year round.

Another point that needs to be explored is the length of time that agriculture would be disrupted versus the potential for increased productivity after the land has been reclaimed. Perhaps the long-term benefits of increased productivity outweigh the short-term disruption of production.

Additional demands on community services that would occur without this proposal have been presented in the section on Affected Environment. The significance of additional demands that would result from this proposal will be presented in the next paragraph. Since reliable data on community revenues and expenditures is not available, a projection of revenues and expenditures will not be attempted. However, additional community services will require additional fiscal expenditures, no matter what the source of added demand. Because revenues from anticipated developments--both from this proposal and without this proposal--will accrue mainly to Campbell County, it should be noted that the potential exists for the county to have a substantial surplus of funds to meet added demands, while the City of Gillette could experience a substantial shortfall of funds. In addition, although the number and origin of commuters would be impossible to estimate without

operating costs, which are incurred at times of low returns to production. The "cost-price squeeze" bears most heavily on the small producer and is the contributing factor in the constant trend away from numerous small, agricultural enterprises toward fewer, but larger enterprises. To remain economically viable the agricultural enterprise must expand. When the owner/operator is unable to expand there are two options to maintain a constant standard of living: 1) To seek employment off the farm or ranch, or 2) to sell the farm or ranch entirely, acquire employment elsewhere, and possibly move to town.

For the agricultural landowner whose land lies over federal coal, modern coal leasing sales agreements are quite lucrative, usually exceeding $1,200 per acre outright with a percentage of each ton of coal produced. This would give the ability to expand any remaining part of the operation, or to relocate entirely to a larger more productive operation. For those agricultural operators whose land does not lie over federal coal, coal development in the vicinity provides job opportunities that would help to maintain their agricultural identities and lifestyles.

The conflict that invalidates concern for the individual agricultural operator as a decision-making tool is the fact that a decision to allow leasing of federal coal, in order to provide alternatives to the landowner, will immediately present impacts to society. On the other hand a decision not to lease, based on concern for preserving the small, family farm, would remove options that the family would need to maintain its standard of living. Therefore, concern for the individual should not be considered as a viable, decision-making tools. The landowner, after all, does retain the right to refuse to sell or lease.
Perhaps pertinent to this point is the fact that the landowner also has the right to a change of opinion up until an agreement is signed. This is illustrated by the fact that the few landowners against coal development in a 1979 survey now indicate that they would negotiate. Again, concern for the individual farmer or rancher is not a valid decision-making tool.

In addition to the more obvious impacts to society, such as increased demands on community services, there are several other points of significance that need to be explored.

One point is the national requirement for energy versus the disruption to agricultural production. Some significant factors for consideration can be found in Table 3.2-1.

extensive research, counties providing residence to commuters may not be fully compensated for added demands on roads, highways, and other services.

Because this action would not result in additional employment, significant socio-economic impacts are not anticipated. Note should be made of the fact that this tract would not contribute to the leasing target because it merely extends mine life, but does not increase annual production.

Net Energy Analysis

A net energy analysis was calculated using the guidance contained in BLM-Washington Office Information Memo 79-282, August, 1979. Approximately 38 British thermal units (BTUs) would be expended to produce a pound of coal. That pound of coal, in turn, would produce about 8,070 BTUs. The ratio of energy produced to that expended is over 214 BTUs/1 BTU.

3.4 Short and Long Term Relationships

In the short term approximately 90 million tons of coal would be extracted from the Little Rawhide Creek tract. This coal would be used for power generation. The tract would be temporarily committed to a single use that would in turn impact other uses such as hunting and livestock grazing. Existing vegetation would be destroyed, air pollution and noise would increase, topography would change, and the VRM class would change from Class IV to Class V.

In the long term approximately 10 million tons of coal would be unrecoverable and would therefore be lost. Ground stability (shear strength) would be weakened to the depth of mining. Evidence of mining and reclamation would remain in the form of high contrast in line, color, texture and from. The soil and vegetation productivity would be increased above premining levels on the reclaimed areas. Long-term productivity for all classes of wildlife would be the same or higher than in the premining habitat.

VRM class would return to Class IV, and the area would again be managed for multiple use. An intensive cultural inventory of the unstudied Little Rawhide Creek tract would be accomplished many years sooner than might otherwise be accomplished without the mine.

3.5 Irreversible and Irretrievable Commitments of Resources

Approximately 90 million tons of coal removed for power generation and 10 million tons that would not be recovered with present mining technologies would be irretrievably lost. Cultural values, aquifers, construction materials, and loss of wildlife would be irretrievable.

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SITE SPECIFIC SUMMARY MATRIX

Tract Name: Little Rawhide Creek

IV. Unsuitability Criteria Results

State: Wyoming

Legal Description: See Map 1.2-1

CRITERION	APPLICABLE TO TRACT	EXCEPTION USED	ADDITIONAL DATA NEEDED	COMMENTS
1. Federal Land Systems	N/A			
2. Rights-of-way and Easements	Yes	Exception #5	No	There is approx. 1 mile of state highway to relocate.
3. Buffer Zones	N/A			
4. Wilderness Study Areas	N/A			
5. Scenic Areas	N/A			
6. Land Used for Scientific Study	N/A			
7. Historic Lands and Sites	N/A			
8. Natural Areas	N/A			

SITE SPECIFIC SUMMARY MATRIX CONT'D

CRITERION	APPLICABLE TO TRACT	EXCEPTION USED	ADDITIONAL DATA NEEDED	COMMENTS
9. Federally Listed Endangered Species	N/A			
10. State Listed Endangered Species	N/A			
11. Eagle Nest	N/A			
12. Eagle Roosts & Concentration Areas	N/A			
13. Falcon Cliff Nesting Sites	N/A			
14. Migratory Birds	N/A			
15. State Resident Fish & Wildlife	N/A			
16. Flood Plains				
17. Municipal Watersheds	N/A			
18. National Resource Waters	N/A			
19. Alluvial Valley Floors (AVFs)	Possible			See section 1.2 of the narrative and Map 1.2-1.
20. State Proposed Criteria	N/A			

SITE SPECIFIC SUMMARY MATRIX

Tract Name: Little Rawhide

I. Coal Data
(From Tract Delineation Report)

State: Wyoming

Legal description: See Map 1.2-1

Element	Present Situation	Anticipated Effect of Leasing/Development	Significance of Anticipated Impact	Data Reliability	Comments
Production rate (tons/yr)	20 million tons	Production of approx. 20 million TPY of coal for public power production.	Low potential 3-4% of yearly production.	Good	
Estimated mine life (yrs)	Will extend the Eagle Butte Mine 5 years.	Loss of 100 million tons of known coal reserves.	Low, positive	Good	
Estimated total reserves (tons in-place)	100 million tons	Known coal reserves will be decreased by tonnage mined over 5 year period.	Low, positive	Good	
Recoverable reserves (tons)	90 million tons	This amount of coal will be supplied to public power companies over 5 year period.	Moderate, positive	Good	
Recovery rate (%)	90 percent	Approximate loss of 10 percent of total coal reserves.	Moderate, positive	Good	
Type of coal (steam/metallurgical)	Steam	Help to meet national energy needs.	High, positive	Good	
Sulfur content/ton	0.41 percent	Sulfur content good.	Low, negative	Good	
Projected work force (construction)	None	N/A	Low, positive	Acceptable	

SITE SPECIFIC SUMMARY MATRIX CONT'D

Element	Present Situation *	Anticipated Effect of Leasing/Development	Significance of ** Anticipated Impact	Data Reliability	Comments
Projected work force (mining)	No new employment.	Increase length of present employment 5 years.	Low, positive	Acceptable	After construction phase, gradual permanent employment will begin to reach a peak 8 years after leasing.
Surface ownership (Federal, State, private, etc.)	Private	Agricultural production would be interrupted.	Low, negative	Outstanding	
Status of surface owner consent and/or consultation	Surface owner consultation completed.	No surface owners indicated a preference against coal leasing.	High, positive	Outstanding	
Type of mine (surface/underground)	Surface	Removal of approx. 90 million tons of coal.	Low, negative	Good	
Coal transportation needs	Approx. 2,000 unit trains per year.	Slight increase in demand placed upon existing rail system.	Low, negative	Good	
Coal access needs	No new access necessary.	N/A	Low, negative	Acceptable	
Coal markets	Generating electricity for public power located in eastern U.S.		Low, positive	Good	

* Figures in parenthesis include the alternative

** Based on assumption that production of low sulfur coal is good.

SPECIALITY Topography and Geology
TRACT Little Rawhide Creek

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Seismic Activity	Aseismic (No earthquake tendency).	None	None	Outstanding	
Paleontology	Fossil leaves & invertebrates common. Fossil vertebrates rare.	Destroy some fossil-bearing strata. Expose some fossil-bearing strata that would not have been exposed.	Low	Outstanding	
Topography	Flatlands	Decrease. Average elevation about 50 feet. Retain uniformity of topography.	Moderate	Outstanding	

SPECIALITY Soils
TRACT Little Rawhide Creek

ELEMENT	PRESENT SITATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Soil erosion potential*	Moderate to high 1/	None	None		Existing laws would reduce the impact to an insignificant level.
Highly saline conditions*	The soils have a low 2/ salinity.	None	None		
Occurence of toxic elements *	There is no evidence of toxic elements found in the soils.	None	None		

*(Eastern Powder River ES, 1979)

1/ Erosion Potential - The susceptibility of a soil to erosion when no cover is present.

Low - Potential erosion is not significant to reduce productivity.

Moderate - Potential erosion is significant to reduce productivity but not to the point of entirely restricting production.

High - Potential erosion will cause a reduction in productivity to practically zero.

2/ Salinity Rating	mmgos/cm
Low	4
Moderate	4-8
High	8

SPECIALITY Reclamation Potential
TRACT Little Rawhide Creek

ELEMENT	PRESENT SITATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Annual Precipitation *	15.5 inches	None	None		
Temperature extremes *	90°F to 0°F or below	None	None		
Growing season *	111 days	None	None		
Success rate of reclamation attempts in the area**	Seven of eight mines in the area rated fairly good or better in reclamation attempts. Fairly good is a 7 on a scale of 1 to 10.	None	None		
Reclamation potential*	Good (8 on a scale of 1 to 10).	It is estimated that productivity will in-increase by 100 percent.	None		

* (Eastern Powder River ES, 1979)
** (Packer, 1974)

SPECIALITY Vegetation
TRACT Little Rawhide

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Vegetation	57 acres open sagebrush with herbaceous; 27 acres open herbaceous with scattered sage.	The vegetation will be destroyed at the rate given in the Alternatives Including the Proposed Action section.	Minor, except to big game.	Good	See wildlife for impacts to big game.
T&E Plants	None			Good	

SPECIALITY Water Resources
TRACT Little Rawhide Creek

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Ground Water					
Occurrence	8 wells				
Quantity (gpm)	25 to 100				* Wide ranges are used due to the various depths from which the water was obtained.
Quality *		See Importance Catagories			
Conductance (umhos/cm)*	500 to 1,900				
Dissolved * Solids mg/L	350 to 1,350				
pH *	6.8 to 7.5				
Importance to people (individual & municipal supplies).	No domestic wells on tract. Two domestic wells & four municipal wells in adjacent area to north and west.	No effect.	No impact.	Good; field observations	Wells supply residences and trailer courts north and west of the tract should not be significantly impacted.
Importance to industry	No industrial wells on or adjacent to the tract.	No effect.	No impact.	Good; field observations	
Importance to livestock and wildlife	One well in use on the tract. Standing pools in bed of Little Rawhide Creek provide permanent supply of poor quality water.	Would destroy the one well on the tract. Should have no significant effect on the alluvial aquifer underlying Little Rawhide Cr.	Minor. Ground water supplies can be replaced by drilling to deeper aquifers, but pumping & maintenance costs would be significantly increased.	Good; field observations	No springs in the area.

SPECIALITY Water Resources
TRACT Little Rawhide Creek

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Importance to agriculture	No irrigation wells in the area.	No effect.	No impact.	Good; field observations	
Surface Water					
Occurrence	None				
Quantity (Acre-Feet)	None				* Data not available because of the reservoirs being dry.
Quality *					
Conductance (umhos/cm)*	None				
Dissolved * Solids mg/L	None				
pH *	None				
Importance to people (individual & municipal supplies)	All streams ephemeral. None used for domestic or public supply in this area.	No effect.	No impact.	Good; field observations	

SPECIALITY Water Resources
TRACT Little Rawhide Creek

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Importance to industry	No use of surface water for industrial use in this area.	No effect.	No impact.	Good; field observations.	
Importance to live-stock & wildlife	No reservoirs in the area to be mined.	No effect.	No impact.	Good; field observations	
Importance to agriculture	No irrigation activities on or adjacent to the tract.	No effect.	No impact.	Good; field examinations	As no additional consumptive use of water would occur, water yielded by the tract for irrigation downstream should not be significantly decreased.

SPECIALITY Land Ownership and Use
TRACT Little Rawhide Creek

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Agricultural Production	Rangeland 84 acres. Dryland 332 acres.	Loss in agricultural production would be at the rate shown in Tables 3.2-1 and 3.3-1.	Minimal	Good	
Recreation	Hunting is the only recreation use on the tract.	Hunting would cease.	Minimal	Acceptable	Unconfirmed use.
Occupied Dwelling	One occupied dwelling.	Dwelling would be removed or destroyed.	Insignificant	Acceptable	
Oil & Gas Production	No oil or gas wells on the tract.	None	N/A	Good	

SPECIALITY Wildlife
TRACT Little Rawhide

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Big Game Antelope	Some tract use mostly spring-fall. Little habitat south of tract so seasonal movements are limited.	Minor. Habitat loss since majority of tract is cultivated. No impairment of seasonal movement.	Minor.	Good	
Small Game	Poor habitat available.	Loss of the few individuals on the tract.	Minor.	Good	
Furbearers	Low density-low habitat diversity.	Displacement of the few individuals on the tract.	Minor.	Good	
Non-game	Five species are likely to occur.	Loss of all species on the site.	Minor.	Good	
Fish	No habitat present.	None	N/A		
Reptiles & Amphibians	Poor habitat - low species density & diversity.	Loss of those species on site.	Minor.	Good	
Songbirds	Poor habitat - low species diversity & density.	Loss of those species on the site.	Minor.	Good	
Waterfowl & Game	No habitat.	None.	N/A		
Raptors	No nests known on tract or nearby.	Loss of hunting habitat.	Minor.	Good	
Endangered Species	None				

SPECIALITY Cultural Resources
TRACT Little Rawhide Creek

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Cultural Sites	No data.	Disturbance and destruction of sites that may be present on the tract.	Irreversible/ Irretrievable commitment of resource.	Good	Intensive inventory of the tract will take place prior to tract development. Any sites identified will be evaluated for National Register eligibility.

SPECIALITY Air Quality
TRACT Little Rawhide Creek

ELEMENT	PRESENT SITATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Air Quality	Concentrarions of particulates estimated at 15 ug/m^3 (state standard is 60 ug/m^3)	Highest ambient concentration of particulates would be ug/m^3. At distances greater than 3.5 miles mine boundary levels would drop below 1 ug/m^3 above background.	Minor	Good	The alternative would increase the particulate concentration less than 8 ug/m^3.

SPECIALITY Visual Resources
TRACT Little Rawhide Creek

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
VRM	Class IV	Classification change from IV to Class V during mine life.	Impact during mine life would be high. The long term, however, will be low since reclamation would restore tract to Class IV.	Good	

SPECIALITY Noise
TRACT Little Rawhide Creek

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Noise sources & level	Sources: Automobile traffic, blasting, railroad traffic, mine equipment.	Noise level would not substantially increase The zones of affected environment would extend to the 50 dB contour: 1/3 mile around tract.	Insignificant	Acceptable	There are no land uses within the affected zones that are sensitive to high noise levels.

SPECIALITY Socio-Economics
TRACT Little Rawhide Creek

Element	Affected Community	Situation in 1979	Trend to 1985 (000)	Effect of Action in 1985	Trend to 1990 (000)	Effect of Action in 1990	Trend to 1995 (000)	Effect of Action 1995	Significance of Impact	Data Reliability
Proposed Action										

No Significant Impact 1/

1/ See the Affected Environment Section for a review of projected Regional Socio-Economic Trends.